



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

SW

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/039,862	10/20/2001	Ting-Lan Ji	PA1815US	9111
22830	7590	03/25/2004		
CARR & FERRELL LLP 2200 GENG ROAD PALO ALTO, CA 94303			EXAMINER JAWORSKI, FRANCIS J	
			ART UNIT	PAPER NUMBER
			3737	3
DATE MAILED: 03/25/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)	
10/039,862	JI ET AL.	
Examiner	Art Unit	
Jaworski Francis J.	3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

The specification is objected to for being presented in part as a series of numbered claims 1-86 in paragraph [0019] spanning specification pages 5 – 17. At end-application and in accordance with 37 CFR 1.75 applicants conclude the specification with Claims 1 – 20. It is these properly presented claims which form the basis of the Office action. Cancellation of the specification claim set or conversion into a narrative description is requested.

The incorporation by reference patent application/issued patent number omitted from pages 1 and 26 of the specification should be provided.

Additionally the following minor informalities should be corrected:

Abstract line 8 -- performed --, page 19 line 2 -- quadrature --, page 23 line 14 -- process --.

(Parenthesized claim numbers below identify the claim or claims being addressed by the specific rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent

granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 – 13, 15 – 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Lizzi et al (RE 35,148). Lizzi et al teaches transmitting ultrasound (14, 16), receiving the tissue-modified echo pulses and generating an electrical signal therefrom in transducer 14, with output on 18, then parallel-processing the signal in narrowband imaging modes (Figs. 3 and 5 – 7) and generating position-organized echo image frame data responsive to output of 38, 68, 146 or 176 and to (clocked) positional information as shown at the bottom of these figures. (Claims 1,7,18).

Since the patent is directed to improvement of anatomic scan images, the position-organized data pertains to the scan area. (Claims 2, 20).

Whereas Figs. 3 and 6 are directed to analog pre-processing in the narrowband mode channels, Figs. 5 and 7 are directed to digital conversion within the channels (Fig. 5) or prior to separation into the pre-processor channels (Fig. 7). (All activities forward of summation may be characterized as 'pre-processing' in contra-distinction to post-processing after scan conversion for example). See also col. 6 lines 49 – 66. (Claims 3, 6,13).

Re-iterating, plural narrowband image modes are processed for non-coherent summation to reduce speckle (claim 4).

Art Unit: 3737

It is inherent that the scan data displayed as a visible image be temporally synchronized via the positional data because the ultrasound wave being a physical pressure wave with slow propagation, time and depth position (as well as bearing position data insofar as it relates to indexed directions each having depth) are intrinsically related, see col. 5 lines 44 – 47. (Claim 5).

Lizzi et al embraces the generation of separate images, each of which represents an area formed by an area former in terms of the frame video storage e.g. tape or disc for individual ones of the narrowband frames if so produced, see col. 6 lines 15 – 21. (Claims 8-9).

Where such plural narrowband images are simultaneously formed and where positional registry is maintained within each narrowband mode channel, the position-related data as well as the position index or information from each mode is input to an image scan converter where conversion to video raster position occurs, see col. 6 lines 55-59. (Claims 10-12).

Since the passband distribution includes for example 5.0 megahertz and 10 megahertz in separate channels as per col. 5 lines 9 - 26, the harmonic of 5.0 mhz as well as the fundamental is being captured (Claim 15).

Digitization in 50,54 or 150,154 is a form of bit-encoding; normalization in 58,158 is a further encoding, weighting/gain scaling in 67a-c, 165a-c is yet further encoding. (Claim 16).

Processing in 67a-67c is characterizable as 'post-processing' meaning occurring after digital demodulation and detection in 66a-66c. (Claim 17).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lizzi et al as applied to claim 13 above, further in view of Maxwell et al (US6514206). If the argument be made that Lizzi et al is not concerned with and thus does not teach either tissue or contrast agent harmonic imaging with the term harmonic being more narrowly construed when associated therewith, it would have been obvious in view of Maxwell et al col. 1 lines 45-60, col. 3 lines 53-56 to provide both specific fundamental and harmonic image data in simultaneous plural imaging modes in order to reduce speckle by frequency compounding as called for in Lizzi et al. (Claim 15).

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lizzi et al in view of Maxwell et al as applied to claim 15 above, and further in view of Henderson et al (US6695783). In Maxwell et al the frame rate is augmented by using multi-line reception, that is, capturing in parallel the receive lines from echo focuses on either side of the transmit line, thereby doubling the receive scanline density for the same capture interval. In order to perform multi-line reception, Maxwell et al invoke the Henderson et al patent in col. 5 lines 64-66. In Henderson et al col. 1 lines 10-34 it is

Art Unit: 3737

noted that for multi-line reception, parallel beamformers or simple duplication of beamform summation were the art standard to provide this capability, albeit this patent provides architecture efficiencies thereover. Thus, It would have been obvious in view of Henderson et al to use standard parallel beamformers to effect the simultaneous multi-mode fundamental and harmonic imaging taught by Maxwell et al in supplement to Lizzi et al.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lizzi et al in view of Maxwell et al as applied to claim 15 above, and further in view of Roundhill et al. The reasoning against claim 15 applies here. Namely that, if Lizzi et al is characterized as not teaching the use of harmonics in the sense of tissue or contrast agent imaging harmonics, then it would have been obvious in view of Maxwell et al to provide both fundamental and tissue harmonic modes in Lizzi et al in order to reduce speckle. Neither Lizzi et al nor Maxwell et al specifically teach the use of plural simultaneous mode imaging to also produce Doppler data. It would have been obvious however in view of Roundhill et al Fig. 10, Doppler outputs of quadrature bandpasses 36, 136 considered together with col. 4 lines 60-66, col. 8 lines 26-35 and col. 10 lines 9-40 to also provide a Doppler output from simultaneous parallel processing mode channels effecting fundamental-harmonic speckle reduction since e.g. harmonic tissue or contrast agent Doppler provides additional valuable information about vascular flow and chamber kinetics.

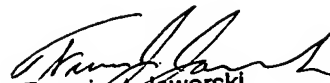
Application/Control Number: 10/039,862
Art Unit: 3737

Page 7

Any inquiry concerning this communication should be directed to Jaworski
Francis J. at telephone number 703-308-3061.

FJJ:fjj

03-18-04


Francis J. Jaworski
Primary Examiner